

U.S. Patent Application Serial No. **09/960,727**  
Amendment dated September 15, 2003  
Reply to OA of **April 14, 2003**

**REMARKS**

Claims 1-19 are pending in this application. Claim 19 has been amended herein.

**Claim 19 is rejected under 35 U.S.C. 112, second paragraph, as indefinite. Claim 19 is rejected under 35 U.S.C. 101 because the claimed recitation of a use, without setting forth any steps involved in the process, results in an improper definition of a process. (Office action point no. 2).**

The rejection is overcome by the amendment to claim 19, which has been amended to positively recite the step of “flowing water to the membrane module ....” Support for this amendment may be found in claim 2, which recites the “flow rate of the untreated ultra pure water” in the membrane module. Further support may also be found in the drawings, which illustrate water flow to the membrane module as discussed in the specification. Flow of water to the membrane module is also discussed, for example, in Example 1 on page 13, line 7.

**Claim 1 is rejected under 35 U.S.C. 102(e) as being anticipated by Katou et al. (U.S. Patent No. 6,158,721). (Office action point no. 4).**

The rejection of claim 1 is respectfully traversed.

Although the apparatus according to the present invention is similar to the apparatus disclosed in Katou et al. in that the resistivity of ultra pure water is controlled by using a gas permeable membrane and dissolving carbon dioxide gas or the like into the ultra pure water, the

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apparatus according to the present invention is structurally and functionally different from that of the present invention. The differences are summarized below:

(A) Structure of Apparatus according to Katou et al.

(A-1) Ultra pure water is divided into two flows.

(A-2) One of the flows is untreated, and the other flow is brought into contact with a gas permeable membrane.

(A-3) Carbon dioxide is dissolved into the ultra pure water via the gas permeable membrane at a high concentration.

(A-4) The once-divided flow of untreated ultra pure water and flow into which carbon dioxide is dissolved via the gas permeable membrane are combined.

(A-5) Ultra pure water having a desirable carbon dioxide concentration (i.e., ultra pure water having a desirable resistivity) is obtained by the above steps.

(B) Structure of Apparatus according to the Present Invention

(B-1) The gas which is dissolved in ultra pure water is:

- a mixed gas containing carbon dioxide gas and another gas which has almost no affect on the resistivity, or

- a mixed gas containing ammonia gas and another gas which has almost no affect on the resistivity.

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(B-2) By dissolving the above mixed gas into the ultra pure water until near saturation, ultra pure water having a desirable carbon dioxide concentration or a desirable ammonia gas concentration (i.e., ultra pure water having a desirable resistivity), dependent on the carbon dioxide or ammonia concentration in the mixed gas, is obtained.

(B-3) Thus, it is not necessary to divide or combine the ultra pure water according to the present invention.

The Examiner has apparently taken Katou's hollow fiber module 11 as the recited "housing to house a gas permeable membrane". The Examiner states that "It is submitted that the gas flow path of Katou et al. is **structurally capable** of supplying carbon dioxide as a mixed gas." (Emphasis added).

However, claim 1 recites: "wherein a mixed gas, selected from the group consisting of a mixed gas comprising carbon dioxide and a gas having a lower resistivity controlling ability than carbon dioxide and a mixed gas comprising ammonia and a gas having a lower resistivity controlling ability than ammonia, **passes the mixed gas path**". That is, the claim recites that the mixed gas is **present** in the apparatus, not simply that the apparatus is **capable** of using a mixed gas. Katou et al. does not disclose use of a mixed gas or mixed gas path.

Applicants therefore submit that claim 1 is not anticipated by and, further, is non-obvious over Katou et al. '721.

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**Claims 2-6, 11 and 12 are rejected under 35 U.S.C. 102(e) as being anticipated by Katou et al. (U.S. Patent No. 6,158,721). (Office action point no. 5).**

The rejection of claims 2-6, 11 and 12 is respectfully traversed.

The differences between Katou et al. and the present invention have been summarized in regard to point no. 4 of the Office action. Applicants again note that Katou et al. does not disclose use of a mixed gas. Claim 2 recites that the unit “produces ultra pure water ... by contacting the ultra pure water with a mixed gas, ....”

Applicants therefore submit that claims 2 and dependent claims 3-6, 11 and 12, are not anticipated by and, further, are non-obvious over Katou et al. ‘721.

**Claims 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Katou et al. in view of Plester (U.S. Patent No. 5,188,257). (Office action point no. 7).**

Reconsideration of the rejection is respectfully requested.

Applicants have argued above that Katou et al. ‘721 does not provide the limitations of base claim 2.

Moreover, Plester’s device is a fairly small device for aerosol cans and household applications, and combining Plester’s device as the gas source in Katou et al.’s apparatus would not appear to be able to allow Katou’s apparatus to function for its intended purpose, which is supplying ultrapure water for the production of semiconductor devices.

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In addition, there is no suggestion in Katou et al. to use carbon dioxide from a gas generator such as Plester's. Katou et al. specifically discloses "a pressure regulating valve for maintaining a constant pressure of the carbon dioxide gas" (column 3, line 13), and clearly this refers to an apparatus using carbon dioxide from a high pressure tank. Likewise, there is no suggestion in Plester to use the carbon dioxide generator in an apparatus such as Katou et al.'s.

Finally, Plester et al. discloses as the gas generating chemicals, sodium bicarbonate and a liquid acid such as phosphoric acid, or a powdered mixture of bicarbonate and a solid acid (column 3, line 35). These would only produce carbon dioxide and perhaps water vapor. This would not meet the limitations of the mixed gas in the present claims.

Applicants therefore submit that a *prima facie* case of obviousness cannot be made using these references, and that claims 9 and 10 are novel and non-obvious over Katou et al. in view of Plester, taken separately or in combination.

**Claims 7, 8, 13 and 14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form. (Office action point no. 8).**

Reconsideration of the objection is respectfully requested. Since Applicants have traversed the rejection of base claim 2, claims 7, 8, 13 and 14 have not been amended.

Reconsideration of the rejections and objections is respectfully requested.

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If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants undersigned agent at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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